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25944 7590 09/22/2008

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EXAMINER	
QUARTERMAN, KEVIN J	
ART UNIT	PAPER NUMBER
2889	

DATE MAILED: 09/22/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,676	11/24/2003	Taisuke Yamauchi	117855	1219

TITLE OF INVENTION: SELF-EMITTING ELEMENT, DISPLAY PANEL, DISPLAY APPARATUS, AND METHOD OF MANUFACTURING SELF-EMITTING ELEMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$0	$1440	$1440	12/22/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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25944 7590 09/22/2008

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,676	11/24/2003	Taisuke Yamauchi	117855	1219

TITLE OF INVENTION: SELF-EMITTING ELEMENT, DISPLAY PANEL, DISPLAY APPARATUS, AND METHOD OF MANUFACTURING SELF-EMITTING ELEMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$0	$1440	$1440	12/22/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
QUARTERMAN, KEVIN J	2889	313-506000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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QUARTERMAN, KEVIN J	
ART UNIT	PAPER NUMBER
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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 192 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 192 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Notice of Allowability	Application No.	Applicant(s)	
	10/718,676	YAMAUCHI, TAISUKE	
	Examiner	Art Unit	
	Kevin Quarterman	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *13 June 2008*.

2. ☒ The allowed claim(s) is/are *1-23*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 0608
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment and remarks received on 13 June 2008 have been entered.

Election/Restrictions

2. Claim 1 is directed to an allowable product. Pursuant to the procedures set forth in MPEP § 821.04(B), claims 12-13, directed to the process of making or using an allowable product, previously withdrawn from consideration as a result of a restriction requirement, are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

3. Because all claims previously withdrawn from consideration under 37 CFR 1.142 have been rejoined, **the restriction requirement as set forth in the Office action mailed on 11 January 2006 is hereby withdrawn**. In view of the withdrawal of the restriction requirement as to the rejoined inventions, applicant(s) are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Allowable Subject Matter

4. Claims 1-23 are allowed.

5. The following is an examiner's statement of reasons for allowance: Regarding independent claim 1, the prior art of record neither shows or suggests a self-emitting element comprising, in addition to other limitations of the claim, a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and an angle changer that is disposed at a periphery of the light-emitting layer, and changes a direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical layer.

6. The closest prior art of Garbuzov to independent claim 1 teaches, in Figure 4, a self-emitting element comprising a light-emitting layer (Organic layers) that is disposed between electrodes (ITO, Top contact) and that emits light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed

from the light-emitting layer, of the protective layer; and an angle changer (inclined surface) that is disposed at a periphery of the light-emitting layer.

7. However, Garbuzov fails to exemplify a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and an angle changer that is disposed at a periphery of the light-emitting layer, and changes a direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical layer, as recited in independent claim 1 of the instant application. Due to their dependency upon independent claim 1, claims 2-7 and 12-13 are also allowable.

8. Regarding independent claim 8, the prior art of record neither shows or suggests a display panel comprising, in addition to other limitations of the claim, a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and a plurality of angle changers, each of the angle changers being disposed at a periphery of each of the light-emitting layers, that change direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle.

9. The closest prior of Garbuzov to independent claim 8 teaches, in Figure 4, a display panel comprising a plurality of light-emitting layers (Organic layers), each of the light-emitting layers being disposed between electrodes (ITO, Top contact), and emitting light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layers to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from the light-emitting layers, of the protective layer; and a plurality of angle changers, each of the angle changer being disposed at a periphery of each of the light-emitting layers.

10. However, Garbuzov fails to exemplify a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and a plurality of angle changers, each of the angle changers being disposed at a periphery of each of the light-emitting layers, that change direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle, as recited in independent claim 8 of the instant application. Due to their dependency upon independent claim 8, claims 9-10 and are also allowable.

11. Regarding independent claim 11, the prior art of record neither shows or suggests a display apparatus comprising, in addition to other limitations of the claim, a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and a plurality of angle changers, each of the angle changers being disposed at a periphery of each of the light-emitting layers, that change direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle.

12. The closest prior art of Garbuzov to independent claim 11 teaches, in Figure 4, a display apparatus comprising a display panel including a plurality of light-emitting layers (Organic layers), each of the light-emitting layers being disposed between electrodes (ITO, Top contact) and emitting light upon applying a voltage between the electrodes (Fig. 1); a protective layer (Planarization) that covers an emitting side of the light-emitting layers, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layers to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from each of the light-emitting layers, of the protective layer; and a plurality of angle changers, each of the angle changer being disposed at a periphery of each of the light-

emitting layers; and a drive unit (See Fig. 1) that drives the light-emitting layers of the display panel and displays an image.

13. However, Garbuzov fails to exemplify a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and a plurality of angle changers, each of the angle changers being disposed at a periphery of each of the light-emitting layers, that change direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle, as recited in independent claim 11 of the instant application.

14. Regarding independent claim 14, the prior art of record neither shows or suggests a self-emitting element comprising, in addition to other limitations of the claim, an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

15. The closest prior art of Garbuzov teaches, in Figure 4, a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal).

16. However, Garbuzov fails to exemplify an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element, as recited in independent claim 14 of the instant application. Due to their dependency upon independent claim 14, claims 15-18 are also allowable.

17. Regarding independent claim 19, the prior art of record neither shows or suggests a display panel comprising, in addition to other limitations of the claim, an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

18. The closest prior art of Garbuzov to independent claim 19 teaches, in Figure 4, a display panel comprising a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes a display layer that includes a light-emitting element (Organic layers); and an output layer (TiO_2) that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal).

19. However, Garbuzov fails to exemplify an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element, as recited in independent claim 19 of the instant application.

20. Regarding independent claim 20, the prior art of record neither shows or suggests a display apparatus comprising, in addition to other limitations of the claim, an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

21. The closest prior art of Garbuzov to independent claim 20 teaches, in Figure 4, a display apparatus comprising a display panel comprising a plurality of self-emitting elements that are arranged two-dimensionally in a matrix form, wherein each of the self-emitting elements includes a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer (Metal); and a drive unit (Fig. 1) that drives the display layer of the display panel and displays an image.

22. However, Garbuzov fails to exemplify an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element, as recited in independent claim 20 of the instant application.

23. Regarding independent claim 21, the prior art of record neither shows or suggests a self-emitting element comprising, in addition to other limitations of the claim, a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the

protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and an angle changer that is disposed at a periphery of the light-emitting layer and changes a direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle, wherein a refractive index of the protective layer is either almost the same as or greater than a refractive index of the light-emitting layer.

24. The closest prior art of Garbuzov to independent claim 21 teaches, in Figure 4, a self-emitting element comprising a light-emitting layer (Organic layers) that is disposed between electrodes (ITO, Top contact) and that emits light upon applying a voltage between the electrodes; a protective layer (Planarization) that covers an emitting side of the light-emitting layer, forms an interface between the protective layer and an external medium, and has a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the corresponding light-emitting layer; a reflective layer (Metal) that covers an opposite side, as viewed from the light-emitting layer, of the protective layer.

25. However, Garbuzov fails to exemplify a protective layer that covers an emitting side of the light-emitting layer and having a thickness that allows the light emitted from the light-emitting layer to undergo total reflection at least once at the interface in an area of the light-emitting layer, the protective layer being disposed on one of the electrodes on an opposite side, as viewed from the light-emitting layer, to the substrate, and an angle changer that is disposed at a periphery of the light-emitting layer and changes a

direction of the light emitted from the light-emitting layer and propagating in the protective layer so that the light is incident on the interface at less than a critical angle, wherein a refractive index of the protective layer is either almost the same as or greater than a refractive index of the light-emitting layer, as recited in independent claim 21 of the instant application.

26. Regarding independent claim 22, the prior art of record neither shows or suggests a self-emitting element comprising, in addition to other limitations of the claim, an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein the angle changer is a micro lens, and a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

27. The closest prior art of Garbuzov to independent claim 22 teaches, in Figure 4, a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer.

28. However, Garbuzov fails to exemplify an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein the angle changer is a micro lens, and a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element, as recited in independent claim 22 of the instant application.

29. Regarding independent claim 23, the prior art of record neither shows or suggests a self-emitting element comprising, in addition to other limitations of the claim,

an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein the angle changer is a micro prism which changes the direction of the light by refraction, and a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element.

30. The closest prior art of Garbuzov to independent claim 23 teaches, in Figure 4, a self-emitting element comprising a display layer that includes a light-emitting element (Organic layers); and an output layer that is transparent, is disposed in an emitting direction of the display layer, and includes an angle changer.

31. However, Garbuzov fails to exemplify an angle changer that changes a direction of light output from a light-emitting element to a direction of the emitting side, wherein the angle changer is a micro prism which changes the direction of the light by refraction, and a refractive index of the output layer is either almost the same as or greater than a refractive index of the light-emitting element, as recited in independent claim 23 of the instant application.

32. The subject device structures described earlier are provided for improving light extraction efficiency. The design is new and unique to the art.

33. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quarterman whose telephone number is (571)272-2461. The examiner can normally be reached on M-TH (7-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on (571) 272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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